STINGING DUE TO *LINUCHE UNGUICULATA* (SCHWARTZ) IN FLORIDA WATERS [1]

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Although Hutton (1952) was cognizant of many reports that *Linuche unguiculata* (Schwartz)[2] could produce stinging sensations to bathers who come in contact with it and was aware that many people believed this medusa caused seabathers' eruption, he was unable to produce either a dermatitis or a stinging sensation on any of numerous human subjects. The several hundred medusae used by Hutton had been collected, placed in aquaria, and kept alive for several weeks prior to testing. He also reported observing thousands of these medusae in the shallow waters of Miami Beach on April 7, 1950, where many people were in the water with not one case of eruption reported.

On July 5, 1954, I observed swarms of "thimble jellyfish" below the New Pass Bridge and at Lido Beach near Sarasota, Florida. Although these were abundant and came in contact with many people in the water, no reactions were noted. A few caught by hand and rubbed on my forearm failed to produce stinging or other irritation. Twelve, measured at the sub-umbrellar surface, ranged in size from 9 to 15 mm in greatest diameter with the average about 11 mm and thousands present were within the limits of this range.

As I observed them daily for two weeks, these medusae remained numerous as they grew larger, apparently causing no irritation among the bathers. On July 21, however, upon arriving at Lido Beach in the late afternoon, I heard several comments from bathers that the "thimbles" were stinging and two individuals who had cupped them out of the water in their hands, exhibited red welts between their fingers which were burning and itching. Upon entering the water where wave action was more violent than usual, I noted that at least some of the medusae were able to prick as

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[2] Referred to by Hutton as *L. unguiculata* Escholtz.

they were washed against my legs and abdomen, leaving nickel-sized patches of red papules, 5 to 10 or more at each contact site. A number were picked up by hand and rubbed on my forearm. These produced an immediate stinging and resultant dermal itching which lasted for more than 5 days, after which a light purple scarring remained for several more days. An eleven year old girl lifted a handful of dead ones from the shore debris and suffered burning and swelling with later purple scarring but no papular dermatitis, suggesting that poison was not injected by nematocysts but that contact with dead ones was dangerous.

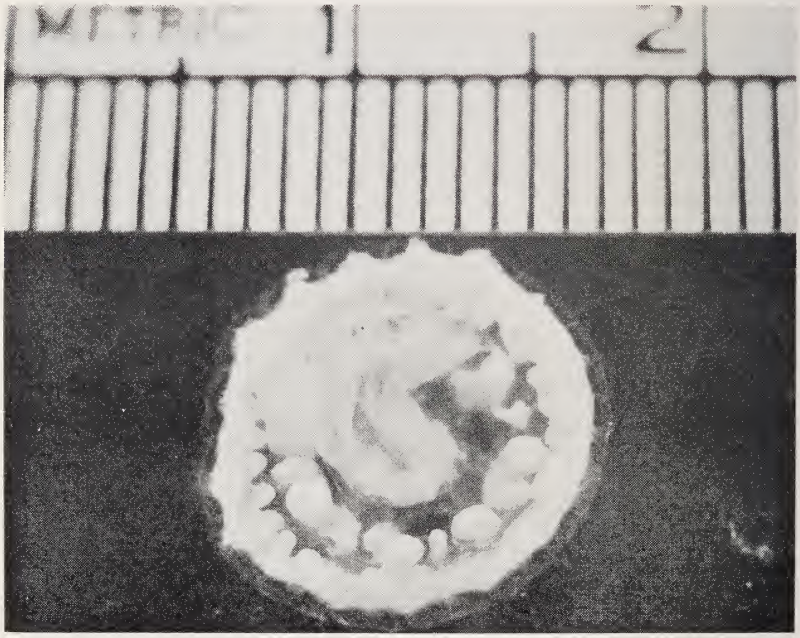

Fig. 1. Subumbrellar surface of *Linuche unguiculata*, 11 mm in greatest diameter. This size did not produce stinging or other irritation.

Dr. Eugenie Clark has provided me with a report of her experiences with these in causing dermatitis, as follows:

"On July 15, 1955 a group of us from the Cape Haze Marine Laboratory anchored our boat about 600 yards offshore from the Range Light at Boca Grande to collect fishes and algae from a large area of rocky bottom covered with algae, sponges, tunicates, and

bryozoa. We used "skin diving" methods, diving in bathing suits in water between 10 to 14 feet deep.

"We began our diving activities about 10:00 a.m. and noticed that the water contained numerous jellyfish, *Linuche* sp. (ca. 4 to 20 cubic meter). I caught a few in my hand and rubbed them between by fingers and then on my forearm but could feel no stinging or other irritation from this.

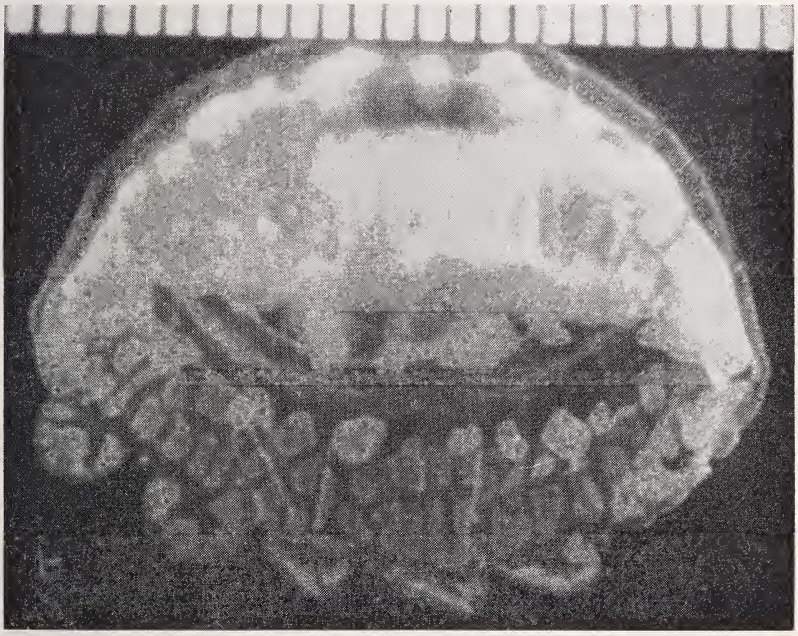

Fig. 2. Lateral view of *Linuche unguiculata*, 23 mm in greatest diameter. This size did produce stinging naturally and when applied experimentally to the human skin.

"Four of us (two thirteen year old boys, Bruce Marshall and Carey Winfrey, Mr. Phil Youngman, a graduate student at Connecticut University and myself) dived in this area for about 2½ hours. We were not particularly bothered by the jellyfish although each of us must have come in contact with hundreds of individuals during this time. I thought I occasionally felt a pricking sensation when a jellyfish came in contact with my skin, especially on my face, but this was so slight I thought it might be just my imagination. By evening areas of skin on my hands, face, throat, and waist-

line just under and above the belt of my bathing shorts, became swollen with red welts that burned and itched. This irritation became worse by the following day especially around my mouth and back of my hands at the bases of the fingers. The swelling began to subside the following day and was mostly gone in one week, except for small areas on the back of my hands and corners of my mouth which continued to be slightly swollen and itchy for over two weeks, then became horny and developed small scabs. My hands retained this condition for over a month, perhaps aggravated by frequent handling of specimens preserved in formalin.

"Messrs. Marshall and Winfrey had similar skin irritations but Mr. Youngman reported no reaction at all from his jellyfish contacts.

"The local people claim that certain individuals are immune to the sting of this "thimble jellyfish". Mr. Beryl Chadwick, who has had twenty-seven years of commercial fishing experience in this region, reports that he has frequently seen blooms of these jellyfish in the Gulf during the latter part of the summer but never at other times."

Measurements of these specimens provided by Dr. Clark, ranged from 11-29 mm, with the average about 22 mm, similar in size to those occurring on July 21, 1954, at Lido Beach. Those averaging 1 cm in greatest diameter were not offensive; those above 2 cm in diameter were a nuisance and in at least three cases the lesions produced were serious enough to warrant medical attention.

Dr. Mary Sears of the Woods Hole Oceanographic Institution has kindly identified the medusae as *Linuche unguiculata* (Schwartz) and has provided the following information:

"This seems to be a species which varies considerably and at one time your specimens might have been referred to *aquila* thought to be a Pacific species. However, Bigelow (1928, p. 510) states that Vanhöffen (1913) 'by his discovery of the supposedly Pacific variety as well as the supposedly Atlantic, among *Linuche* from the Tortugas, Florida, proved that the two are not separated geographically. This, Thiel (1927) substantiates by again finding Atlantic specimens (from Haiti) showing the arrangement of subumbral sacs which Mayer (1910) had thought typical of the Pacific *aquila*. This, according to Thiel, indicates the co-existence in the Atlantic of two distinct forms of *Linuche* of the *unguiculata* group, either varieties (*aquila* and *unguiculata*) of one species, or possibly distinct species. But the great variability in the num-

ber and in the radial location of the subumbral sacs of the *Arcturus* series and of other specimens in the Museum of Comparative Zoology described below, tends to support Vanhöffen's (1913) explanation of the difference between *unguiculata* and *aquila* as due, simply to individual variation. They are therefore united here, following him, under the older of the names.'

"Bigelow still held to this view in a paper written 10 years later. Stiasny (1931) also accepted this view."

That these specimens from the Gulf are capable of stinging is suggestive that those with which Hutton worked might be either intra-specifically different, smaller specimens perhaps incapable of producing irritation, or affected in some way by the long laboratory confinement.

The average length of life of the majority of free-swimming medusae is possibly two months. Some have long planktonic lives but it would seem that for *Linuche* it is relatively short.

Linuche is apparently a neritic surface living form. Hydrographic conditions may have been the important factor in its great temporary abundance in 1954 at Sarasota and 1955 at Boca Grande. Russell (1953) has discussed the value of medusae as indicators of the movement of water masses in the sea, previouly shown by Kramp (1927). However, the 1954 abundance at Sarasota followed a red-tide year and numerous observations revealed entirely different populations of many organisms at Lido Beach from those occurring during the summers of 1952-1960 exclusive of 1954. The fish population was drastically reduced and a notably high crab population prevailed. So it is felt that the previous presence of red-tide could have been a factor. Numerous visits made to Lido Beach and to other Gulf Coast beaches during July and August from 1952 through 1960 have not revealed evidence that *Linuche* was present, certainly not in the swarming numbers observed in July of 1954 or 1955. However, because a species is recorded as occurring in a certain area, does not mean that it must necessarily be abundant there, or even present at all in some years.

Acknowledgments

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Literature Cited

BIGELOW, H. B.

1928. Scyphomedusae from the Ancturus Oceanographic Expedition. Zoologica, N. Y. Zool. Soc., 8(10): 495-524.

1938. Plankton of the Bermuda Oceanographic Expeditions. VIII. Medusae taken during the years 1929 and 1930. Zoologica, N. Y. Zool. Soc., 23(2): 99-189.

HUTTON, ROBERT F.

1952. Schistosome cercariae as the probable cause of seabathers' eruption. Bull. Mar. Sci. of the Gulf and Caribbean, 2: 346-359.

KRAMP, P. L.

1927. The hydromedusae of the Danish waters. Mem. Acad. Sci. Lettres, Danemark, Sect. Sci. Serv. 8, Tome XII, No. 1, pp. 1-291; 24 text charts.=D. Kgl. Danske Vidensk. Telsk. Skr. Natur. Og Math. Afd. 8. Raekke, XII, I.

MAYER, A. G.

1910. Medusae of the World. Carnegie Inst., Washington Publ. No. 109 (3 vols.): 734 pp, 76 pls.

RUSSELL, F. S.

1953. The medusae of the British Isles. Cambridge Univ. Press, 530 pp.

STIASNY, G.

1931. Ueber einige Coelenterata von Australien. Zool. Meded., Rijks Mus. Nat. Hist., Leiden, 14: 27-40.

THIEL, M. E.

1927. Die Scyphomedusen des Zoologischen Staatsinstits und Zoologischen Museums in Hamburg. Mitth. Zool. Staatsmstitut und Zool. Mus., Hamburg, 43: 1-34.

VANHOFFEN, E.

1913. Uber Westmdische Medusen. Zool. Jahrb., Suppl., 11: 413-432.